IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
<u>BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES</u>

Application No.: 10/820,976	§		
Filed: April 8, 2004	§	Examiner:	Sugent, James F
Inventor(s):	§	Group/Art Unit:	2116
James W. Templeton	§	Atty. Dkt. No:	5900-00101
	§		
Title: METHOD AND APPARATUS FOR IMPROVED DC POWER DELIVERY MANAGEMENT AND CONFIGURATON	§		

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

Further to the Notice of Appeal filed on November 13, 2007, Appellants present this Appeal Brief. Appellants respectfully request that this appeal be considered by the Board of Patent Appeals and Interferences.

I. REAL PARTY IN INTEREST

The present application is owned by Zilker Labs, the assignee of record, a corporation organized and existing under and by virtue of the laws of the State of Delaware, and having an office and place of business at 4301 Westbank Dr, Building A, Suite 100, Austin, TX 78746.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee which will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-39 are pending. Claims 1-39 are rejected, and the rejection of these claims is being appealed. A copy of claims 1-39 is included in the Claims Appendix attached hereto.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been submitted subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed toward a power delivery management system (e.g. Fig. 6; page 13, lines 21-26). The power delivery management system comprises a plurality of digital power management devices (e.g. Fig. 6, 602, 604, 606; page 13, lines 28-29), where each of the plurality of power management devices comprises a plurality of functions (e.g. Fig. 6, 602, 604, 606, functions 1-N included in each of 602, 604, 606; page 13, line 29), where each of the plurality of digital power management devices is operable to provide power to one or more point of load devices (e.g. Fig. 6, $Vout_1$, $Vout_2$, $Vout_M$ for 602, 604, 606, respectively; Fig. 11, 900, 902; page 23, lines 3-4). The power delivery management system further comprises a control and communication bus (e.g. Fig. 6, 610; page 13, lines 28-30), where each one of the plurality of digital power management devices is coupled to the control and communication bus (Fig. 6, 602, 604, 606, 610; page 13, lines 28-30). Each respective one of the plurality of digital power management devices includes a controller operable to control the functions of the respective digital power management device (e.g. Fig 8, 742a and 742b; page 17, lines 27-30; also Fig. 6, 602, 604, 606; page 13, lines 16-18). Finally, the plurality of digital power management devices are operable to communicate with each other over the control and communication bus to exchange information to coordinate their functions (e.g. Fig. 6, 602, 604, 606, 610; page 14, lines 5-6 and lines 7-13).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chapuis et al. (U.S. Patent No. 7,049,798 B2, herein referred to as "Chapuis1") in view of Chapuis et al. (U.S. Patent No. 7,000,125 B2, herein referred to as "Chapuis2").

VII. ARGUMENT

Ground of Rejection:

Claims 1-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chapuis et al. (U.S. Patent No. 7,049,798 B2, herein referred to as "Chapuis1") in view of Chapuis et al. (U.S. Patent No. 7,000,125 B2, herein referred to as "Chapuis2"). Appellants traverse this rejection for the following reasons.

Claims 1-39:

To establish a *prima facie* case of obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Appellants respectfully submit that the cited references, taken individually or in combination, do not teach or suggest all the limitations recited in claim 1.

Appellants respectfully submit that the cited references taken together or separately do not teach or suggest at least the following: "a power delivery management system" comprising "a plurality of digital power management devices", "a control and communication bus, wherein each one of the plurality of digital power management devices is coupled to the control and communication bus," "wherein the plurality of power management devices are operable to communicate with each other over the control and communication bus to exchange information to coordinate their functions". Instead, Chapuis1 and Chapuis2 teach a system in which POL regulators are adapted to provide fault monitoring data to a system controller over a control and communication bus.

In general, Appellant's system is directed to a system of POL regulators that operate in a "peer-to-peer" like manner, wherein the respective POL regulators exchange information with each other to coordinate their functions (without a system controller). The Chapuis references teach the exact opposite type of system, i.e., the Chapuis references require a system controller that coordinates the functions of the POL

regulators. In the Chapuis references, the POL regulators are not able to communicate with each other, but rather only communicate with the central controller. This is a significant difference between the present claims and the teaching of the Chapuis references.

Coordinating Functions is Different than "Synchronizing"

Appellants respectfully submit that "coordinating functions" as recited in claim 1 is <u>not</u> synonymous with the "synchronizing" disclosed in Chapuis2 and Chapuis1. Appellants submit that the "synchronization" disclosed by both Chapuis1 and Chapuis2 is directed to the commonly understood and accepted practice of signal synchronization, and is therefore <u>not directed</u> to presenting a particular order or sequence of events [functions] to carry out. Appellants further submit that there is no support in either Chapuis1 or Chapuis2 to interpret "synchronization" to mean "presenting a particular order or sequence of events [functions] to carry out". The term "synchronizing" has a well-understood meaning in the art, and it is clear that Chapuis1 and Chapuis 2 both use the term accordingly. For example, Chapuis1 states in column 2, lines 51-55 that "the bi-directional serial data bus is either a two-wire serial bus (e.g., I^2C) that allows data to be transmitted asynchronously or a single-wire serial data bus that <u>allows data to be transmitted synchronously (i.e., synchronized to a clock signal)</u>".

One skilled in the art will readily recognize that "asynchronous data transfer" references data being transferred between devices without the use of a common clock signal, while "synchronous data transfer" refers to data being transmitted between devices using a common (synchronizing) clock signal. Data transmission is distinct from function coordination, the former pertaining to means of relaying information/data between endpoints, the latter pertaining to means of organizing and/or arbitrating the functions of interoperating and/or communicating devices and/or systems with respect to each other. While data transmission may in fact be <u>a part</u> of said coordinating of functions, it is not synonymous therewith. Chapuis1 and Chapuis2 reference synchronous and asynchronous data transfer throughout, in each an every case within its intended meaning well understood in the art (and as described above – for example, see

also Chapuis1, Col. 6, lines 25-31, and claims 19 and 20). Accordingly, Chapuis1, column 6, lines 36-52 merely state that a clock signal is used to synchronize devices, that is, to allow <u>synchronous data transfer</u> between these devices, and offers no teaching or specifics about coordinating functions of the devices.

Furthermore, Appellants respectfully submit that it is not necessary for claim 1 to explicitly recite the meaning or intention of what is done when functions coordinate. The claim recites power management devices, each of which comprises a plurality of functions and a controller operable to control those functions. Appellants submit that the concept of coordinating those functions, in the context of the claim itself and Appellants' own specification does not require further elucidation, as one skilled in the art would readily recognize "coordinating functions" to pertain to organization and/or arbitration of the functions of the interoperating and/or communicating power management devices with respect to each other. In other words, a capability of the power management devices to coordinate their functions is indicative of the ability of a power management device to perform its functions not only independently of the other power management devices, but also informed and/or directed by how other power management devices perform their own respective functions. In addition, claims 4 and claim 22 include further limitations reciting specific functions, the coordination of which would equally be well understood by those skilled in the art. Furthermore, Appellants submit that the Present Application provides examples of the functions and of coordinating the functions, whether for a single POL regulator or for multiple POL regulators.

Therefore, Appellants respectfully submit that interpreting "coordinating functions" (recited in claim 1) to be synonymous with "synchronizing devices" (disclosed, for example, in column 6, lines 36-52 of Chapuis1) is not only incorrect in the context of the art of record, it is also not supported in either the Present Application or in Chapuis1 and/or in Chapuis2. Appellants respectfully resubmit – in summary – that the concept of signal synchronization is well known to those skilled in the art and is clearly distinct from the concept of coordinating functions as recited in claim 1 and also disclosed in the specification of the Present Application.

The POL Regulators in Chapuis do Not Exchange Information

Appellants also respectfully submit that the POL regulators disclosed in Chapuis1 and Chapuis2, (whether taking each reference singly or in combination) are **not** exchanging information (e.g. cycles and a data bit) with each other either directly or via the controller (210). Appellants respectively submit that there is no teaching or support in Chapuis1 and/or Chapuis2 for information being exchanged **between** the POL regulators. Appellants submit that Chapuis1 explicitly teaches throughout that information exchange takes place between the controller and any given one of the POL regulators, not between the POL regulators themselves. There are no examples of, and Appellant finds no support in Chapuis1 and/or Chapuis2, taken singly or in combination, for information being sent by one POL regulator directly to another POL regulator, or for information being sent by one POL regulator to the central controller, and the central controller relaying that information to any of the other POL regulators. "Exchanging information" implies information being relayed between the POL regulators, not merely from a POL regulator to a central controller. As taught in Chapuis1, information is exchanged between any given one of the POL regulators (220, 230, 240 and 250) and the power supply controller (210). In fact, Chapuis1 clearly teaches that it is the controller (210) that monitors the POL regulators in addition to each POL regulator potentially controlling its own functions independently of other POL regulators. This is in contrast to the POL regulators exchanging information to coordinate their functions as recited in claim 1. Therefore, the feature of digital power management devices exchanging information over the control and communication bus to coordinate their functions is missing from Chapuis1 and Chapuis2, taken singly or in combination, and is neither taught nor suggested by Chapuis1 and/or Chapuis2.

Appellant would also like to reiterate that the presence of the system controller in the system disclosed by Chapuis1, combined with the only method of transmitting information taught in Chapuis1, which is disclosed in figure 5, is indicative of Chapuis1 teaching away from a system configuration in which the POL regulators are enabled and configured to coordinate their functions, since such coordination is performed by the

controller in the system of Chapuis1. Chapuis1 is very clear on the specific role of the controller in managing the system from a central location, whether the controller is configured outside or inside a POL regulator, while each POL regulator is merely operable to control its own functions (see column 5, lines 47-58). Figure 2 clearly shows a power supply controller (210) coupled to the bus (whether as an individual component or as part of an additional device, e.g. another POL regulator – see column 4, lines 27-30), and the flowchart of figure 7 clearly shows in step 750 that at least a portion of the fault-monitoring data is provided to the power supply controller. Chapuis1 does not teach or suggest or provide a motivation for alternate embodiments that do <u>not</u> include the controller for coordinating and/or controlling the functions of the POL regulators. In other words, Chapuis1 is silent on the concept of the POL regulators exchanging information to coordinate their functions. This distinction is further underscored by the configuration of the components disclosed by Chapuis1, individually and within the system. For example, the POL regulators of Chapuis1 each include a "control unit" as shown in figures 3-1 and 3-2 (comparable to the "controller" recited in claim 1), while an additional and distinct controller (separate from the "control unit") is responsible for monitoring the POL regulators, hence managing the system. Because the system controller is responsible for said coordinating, there is no motivation for the system controller to relay any information received from one POL regulator to another POL regulator.

Appellants further submit, that information received by the POL regulators from sources <u>other</u> than the controller is explicitly disclosed by Chapuis1 and Chapuis2 as comprising fault monitoring data, which, as Chapuis1 also clearly indicates, originates from an external device or sense circuit corresponding to the given POL regulator (see figure 3-2, which discloses an example of the configuration of sense circuit 330), with the fault monitoring data containing information on the given POL regulator or its output (see column 5, lines 13-17). It is thus clear from the specification of Chapuis1, including the figures, that Chapuis1 teaches a central controller performing the monitoring of the POL regulators, and any coordination of the functions of the POL regulators (see also column 8, lines 18-33).

Therefore, in summary, Appellants respectfully submit that are NO examples of information being sent by one POL regulator to the central controller, and the central controller subsequently relaying that information to any of the other POL regulators. POL regulators "exchanging information" implies information being relayed between the POL regulators, whether directly or through a controller. Thus, Appellant submits that neither Chapuis1 nor Chapuis2 offer evidence or teaching for data being exchanged between the POL regulators, directly, or indirectly through a controller.

The POL Regulators in Chapuis do Not Exchange Information to Coordinate their Functions

Appellants further submit that as recited in claim 1, the digital power management devices are not only operable to communicate with each other over the control and communication bus, but they are operable to do so to exchange information to coordinate their functions. While Chapuis2 teaches that the "POL regulators communicate with each other over the current share interface" and a "synch/data line may be used to communicate synchronization information to permit phase interleaving of the POL regulators", claim 1 recites a plurality of digital power management devices that are operable to communicate with each other over the control and communication bus to exchange information to coordinate their functions. It is clear from Chapuis2 that the current share interface is distinct and different from the control and communication bus, and represents an additional interface, or more precisely, an additional group of interfaces. Therefore, the current share bus, which is distinct from the control and communication bus, and the transmission of synchronization information (which has been shown above to be completely distinct from coordinating functions) being sent over the synch/data bus is not relevant.

Further to the point, it is evident that the specification of Chapuis2 discloses distinct multiple buses coupling selected ones of the POL regulators to each other, in contrast to claim 1, which discloses a single control and communication bus, each bus in Chapuis2 serving a different function. In Figure 3 of Chapuis2, an intra-device interface

is provided between individual ones of the POL regulators for specific interactions, such as current share or paralleling, e.g., current share interface (CS1) provided between POL0 106 and POL1 108, and CS2 provided between POL4 112 and POLn 114 (see column 4, lines 45-49). Chapuis2 also discloses a controller (102) distinct from the POL regulators, which communicates with the POL regulators by writing and/or reading digital data via a serial bus, illustrated in FIG. 3 as the synch/data bus (see column 5, lines 1-5). In addition, Chapuis2 states that one of the functions of the system controller is fault management (one example of "coordinating functions" as disclosed in the Present Application), which is achieved through the system controller's communicating with the POL regulators over a second bus (OK/fault bus in figure 3) that is distinct from the synch/data bus (see column 5, lines 11-15).

Thus, Column 7, lines 20-28 of Chapuis2 disclose one embodiment of current sharing, which is achieved not over the control and communication bus but over a dedicated current share interface which does not couple all the POL devices together, merely pairs of POL devices, and which is used in addition to the control and communication (synch/data) bus that does couple all the POL devices together (see FIG. 3). It is clear from at least these teachings that the intra-device interfaces (CS1 and CS2) are therefore also clearly distinct from both the OK/fault bus and the synch/data bus, as also argued above, and that the current-share interfaces cannot be interpreted as comprising a control and communication bus. Chapuis2 teaches the OK/fault bus and the synch/data bus operating as control and communication buses, and clearly teaches that the current share interface is specifically configured to allow POL regulators to operate in parallel to produce a single output voltage (see column 4, lines 45-57). Appellant further submits that the combination of features recited in claim 1 are in fact directed to a power management system that does not require and additional current share interface for the power management devices to perform current sharing, as the power management devices are operable to exchange information over the control and communication bus to coordinate their functions, including current sharing.

Further in accordance with the configurations described above, Chapuis2 teaches four different modes of operation, and specifically states that when the POL regulators operate as an array, the behavior of each POL regulator and the array as a whole coordinated by a system controller (see column 7, lines 29-31). Furthermore, even in the presence of local control over certain functionality in addition to the central control performed by the controller, the system controller is still responsible for coordinating the functions of the POL regulators (see column 7, lines 40-45). It is therefore clear that Chapuis2 neither teaches, nor suggests a system in which a plurality of digital power management devices are operable to communicate with each other over a control and communication bus to exchange information to coordinate their functions.

<u>Therefore, whether taken singly or in combination, Chapuis1 and/or Chapuis2 do not teach, suggest or anticipate a system in which a plurality of digital power management devices are operable to communicate with each other over a control and communication bus to exchange information to coordinate their functions.</u>

Claims 2-39 depend on independent claim 1. By virtue of their dependence, claims 2-39 are believed to patentably distinguish over the cited references for at least the reasons given above with regard to their respective base claims. In addition, Applicant presents arguments for certain of the dependent claims as follows:

<u>Claim 2:</u>

As Appellants have argued above, both Chapuis1 and Chapuis2 clearly teach a power delivery/management system, in which a system controller is used to coordinate the functions of a plurality of POL regulators. Consequentially, neither Chapuis1 nor Chapuis2 teach, suggest, or provide motivation for a system in which at least one of a plurality of power management devices is operable to control the functions of one or more other ones of the plurality of power management devices. Since coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller, there would be no need and/or motivation

in the system of Chapuis1 and/or Chapuis2 to devise and configure any one of the POL regulators to coordinate and/or control the other POL regulators. Furthermore, there is no teaching and/or indication in either Chapuis1 or Chapuis2 of any of the POL regulators being capable of performing such control of the functions of one or more other POL regulators.

Claim 3:

As argued above regarding claim 2, neither Chapuis1 nor Chapuis2 teach, suggest, or provide motivation for a system in which at least one of a plurality of power management devices is operable to control the functions of one or more other ones of the plurality of power management devices. Consequentially, neither Chapuis1 nor Chapuis2 teach, suggest, or provide motivation for any given POL regulator to provide status information over the control and communication bus to another POL regulator that is operable to control the given POL regulator. Since coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller, there is no motivation in either Chapuis1 or Chapuis2 for any given POL regulator providing status information to other POL regulators, and there is especially no motivation for a given POL regulator providing status information to other POL regulators operable to control the given POL regulator.

Claim 15:

As argued above, coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller. Consequently, there is no teaching, suggestion, and/or motivation in either Chapuis1 or Chapuis2 for two or more of a plurality of digital power management devices grouped in a current sharing configuration to be operable to automatically reconfigure themselves in response to a failure of one or more of the two or more of the plurality of digital power management devices grouped in the current sharing configuration. Furthermore, Chapuis1 and Chapuis2 are entirely silent on POL regulators

configured in a current sharing configuration having any capability to automatically reconfigure themselves in response to a failure of one ore more POL regulators configured in the current sharing configuration, and provide no suggestion or motivation (due to the presence of a system controller) for such POL regulators. Finally, at least Chapuis2 clearly teaches POL regulators being configured in a current sharing configuration using a current share interface that is separate and distinct from the control and communication bus.

Claim 16:

Chapuis1 and Chapuis2 fail to disclose or suggest one of two or more of a plurality of digital power management devices grouped in a current sharing configuration being operable to be automatically identified as a master device for the current sharing configuration. Since coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller, there would be no need for any of the POL regulators to be automatically identified as a master device for a current sharing configuration, since such identifying would be performed by the system controller. Furthermore, Chapuis1 and Chapuis2 are entirely silent on POL regulators configured in a current sharing configuration being automatically identified as a master device for a current sharing configuration. Furthermore, Chapuis2 specifically discloses an additional current share interface that is separate and distinct from the control and communication bus coupling all the POL regulators together.

Claims 17-19:

Chapuis1 Chapuis2 fail to disclose or suggest a POL regulator that is automatically identified as a master device for a current sharing configuration, and this master device automatically reconfiguring the current sharing configuration in response to a failure of one or more of the two or more of the plurality of digital power management devices grouped in the current sharing configuration. Since coordinating of

the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller, reconfiguration of the current sharing configuration in response to any failure would be performed by the system controller in the systems of Chapuis1 and Chapuis2. Furthermore, due to the presence of a system controller in both Chapuis1 and Chapuis2, there would be no motivation to design and implement such a POL regulator. For at least the same reasons, there is no motivation and teaching in either Chapuis1 or Chapuis2 for such a master device (master POL regulator) automatically transmitting load current and/or load voltage and/or measured status data, and for the same master device to limit and/or control output load current and/or output load voltage and/or output load temperature, as such control would be performed by the system controller. Furthermore, Chapuis2 specifically discloses an additional current share interface that is separate and distinct from the control and communication bus coupling all the POL regulators together.

Claim 20:

As argued above, coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by the system controller. Consequently, there is no teaching or suggestion in Chapuis1 and/or Chapuis2 for each of the plurality of digital power management devices providing feedback data to all other ones of the plurality of digital power management devices. In Chapuis1 and Chapuis2, the POL regulators only provide feedback data to a system controller, and only upon the system controller requesting such feedback data.

Claims 23-24:

Due to a system controller performing the coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2, the POL regulators do not automatically transmit a respective measured or target voltage value, and/or one or more respective output voltage values on the control and

communication bus to support voltage tracking. Overall, Chapuis1 and Chapuis2 are entirely silent on the POL regulators automatically transmitting any information/status/target data on the control and communication bus to support voltage tracking.

Claims 30-31:

Chapuis1 and Chapuis2 do not disclose the POL regulators automatically self-testing and/or auto-calibrating. Furthermore, since coordinating of the functions and control of the POL regulators operating in an array in the system disclosed by Chapuis1 and Chapuis2 is performed by a system controller, there would be no motivation for any of the POL regulators configured in the system(s) of Chapuis1 and Chapuis2 to automatically self-test and/or auto-calibrate.

For the foregoing reasons, it is submitted that the Examiner's rejection of claims 1-39 was erroneous, and reversal of the decision is respectfully requested.

The Commissioner is authorized to charge any fees which may be required, or credit any overpayment, to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5900-00101/JCH.

Respectfully submitted,

/ Jeffrey C. Hood/

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VIII. CLAIMS APPENDIX

The claims on appeal are as follows.

1. A power delivery management system, the system comprising:

a plurality of digital power management devices, wherein each of the plurality of power management devices comprises a plurality of functions, wherein each of the plurality of digital power management devices is operable to provide power to one or more point of load devices; and

a control and communication bus, wherein each one of the plurality of digital power management devices is coupled to the control and communication bus;

wherein each respective one of the plurality of digital power management devices includes a controller operable to control the functions of the respective digital power management device; and

wherein the plurality of digital power management devices are operable to communicate with each other over the control and communication bus to exchange information to coordinate their functions.

2. The system of claim 1,

wherein at least one of the plurality of digital power management devices is also operable to coordinate and/or control the functions of one or more other ones of the plurality of digital power management devices.

3. The system of claim 2,

wherein the other ones of the plurality of digital power management devices are operable to provide status information over the control and communication bus to the at least one of the plurality of digital power management devices.

4. The system of claim 1,

wherein the plurality of functions comprise one or more power delivery functions;

wherein each respective one of the plurality of digital power management devices includes a controller operable to control the one or more power delivery functions of the respective digital power management device.

5. The system of claim 1,

wherein at least a subset of the plurality of digital power management devices each comprise the same functions.

6. The system of claim 1, wherein one or more of the plurality of digital power management devices comprises a voltage converter unit.

7. The system of claim 6, wherein the voltage converter unit comprises a DC (direct current) to DC voltage converter.

8. The system of claim 1, wherein the control and communication bus is a digital bus.

9. The system of claim 8, wherein the control and communication bus comprises at least one of:

error detection capability; and

a training sequence to allow quick clock recovery.

10. The system of claim 8, wherein the control and communication bus is configured to allow bus transitions to be used to perform clock synchronization between devices coupled to the control and communication bus.

11. The system of claim 8, wherein the control and communication bus comprises one or more digital communication paths, wherein each one of the one or more digital communication paths comprises one or more dedicated signals.

12. The system of claim 11, wherein the one or more digital communication paths are operable to be modulated onto an input supply voltage that provides voltage to the system.

13. The system of claim 1, wherein each individual one of the plurality of digital power management devices is operable to be programmed and/or configured across the control and communication bus.

14. The system of claim 1, wherein two or more of the plurality of digital power management devices are operable to be grouped together in a current sharing configuration.

15. The system of claim 14, wherein the two or more of the plurality of digital power management devices grouped in the current sharing configuration are operable to automatically reconfigure themselves in response to a failure of one or more of the two or more of the plurality of digital power management devices grouped in the current sharing configuration.

16. The system of claim 14, wherein one of the two or more of the plurality of digital power management devices grouped in the current sharing configuration is operable to be automatically identified as a master device for the current sharing configuration.

17. The system of claim 16, wherein the master device is operable to automatically reconfigure the current sharing configuration in response to a failure of one or more of the two or more of the plurality of digital power management devices grouped in the current sharing configuration.

18. The system of claim 16, wherein in support of the current-sharing configuration the master device is operable to automatically transmit one or more of:

a respective measured load current;

a respective measured load voltage; and

respective measured status data.

19. The system of claim 16, wherein in support of the current-sharing configuration the master device is operable to limit and/or control one or more of:

output load current;

output load voltage; and

output load temperature.

20. The system of claim 1, wherein each one of the plurality of digital power management devices is operable to provide feedback data to all other ones of the plurality of digital power management devices.

21. The system of claim 20, wherein the feedback data comprises real-time data.

22. The system of claim 1, wherein the functions of the plurality of digital power management devices comprise at least one of:

supply sequencing;

phase offset adjustment;

current sharing;

voltage programming and voltage tracking; and

ramp rate control.

23. The system of claim 22, wherein each one of the plurality of digital power management devices is operable to automatically transmit a respective measured or target voltage value on the control and communication bus to support the voltage tracking.

24. The system of claim 22, wherein each one of the plurality of digital power management devices is operable to automatically transmit one or more respective output voltage values on the control and communication bus to support the voltage tracking.

25. The system of claim 1, wherein the functional features of the plurality of digital power management devices include margining.

26. The system of claim 1, wherein the functional features of the plurality of digital power management devices include voltage supply sequencing.

27. The system of claim 1 further comprising at least one master control device coupled to the control and communication bus, wherein the at least one master control device is operable to centrally control the plurality of digital power management devices to implement advanced features.

28. The system of claim 27, wherein the advanced features comprise reconfiguring and/or reprogramming one or more of the plurality of digital power management devices.

29. The system of claim 27, wherein the advanced features comprise one or more of:

fault prediction;

air-flow control; and

advanced voltage supply sequencing.

30. The system of claim 1, wherein each one of the plurality of digital power management devices is operable to automatically self-test.

31. The system of claim 1, wherein each one of the plurality of digital power management devices is operable to auto-calibrate.

32. The system of claim 1,

wherein the power delivery management system is comprised on a printed circuit board;

wherein each of the plurality of digital power management devices is distributed on the printed circuit board.

33. The system of claim 1,

wherein each of the plurality of digital power management devices comprises an integrated circuit.

34. The system of claim 1, wherein the control and communication bus is a serial bus.

35. The system of claim 27,

wherein the master control device is operable to control the plurality of digital power management devices through communicating with the plurality of digital power management devices over the control and communication bus.

36. The system of claim 35, wherein the control and communication bus is a serial digital control and communication bus.

37. The system of claim 35, wherein said communicating with the plurality of digital power management devices comprises each one of the plurality of digital power management devices providing feedback data to the master control device.

38. The system of claim 35, wherein the master control device comprises a controller operable to execute functions corresponding to each of the plurality of digital power management devices to control the plurality of digital power management devices.

39. The system of claim 35, wherein the plurality of digital power management devices provide status information over the control and communication bus to the master control device.

IX. EVIDENCE APPENDIX

No evidence submitted under 37 CFR §§ 1.130, 1.131, or 1.132 or otherwise entered by the Examiner is relied upon in this appeal.

X. <u>RELATED PROCEEDINGS APPENDIX</u>

There are no related proceedings known to Appellants, Appellants' legal representatives, or assignee which will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.